Mathematics used by all, detasted by many

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We as human being need something to communicate with others and share our thoughts. For this we depend on our mother tongue and other languages. But we need the idea of mathematics to live our life because mathematics is the language of the universe in broader sense.

A few years back when I met one of my friends in a marriage ceremony and in the course of our conversation his son, twelve years old told, "I hate mathematics." Being a mathematics teacher his conclusion on mathematics made me very sad. Because I love mathematics. Very recently during a training program of both the lower and upper primary teachers (NISHTHA) on the module PEDAGOGY OF MATHEMATICS, to all the teachers present in the hall I asked to raise their hands who love mathematics. With a heavy heart I have to say that only twenty percent raised their hands. It is alright, being LP and UP teachers, many of them were not subject teachers of mathematics. But yet 20% should be a matter of concern for all of us. Last year also along with some of my enthusiastic students I had a random project on "Mathematics liking students" and the outcome was surprisingly less than 20%.

In a country which taught the world to count, whose system of numeration (DECIMAL) was adopted by the world community as international system of numeration, where zero is invented, does this 20% sound very encouraging?

Well, let me ask some basic questions. How many members do you have in your family? At what time do you wake up in the morning? Usually for how many hours do you study? What is your salary? What is the rate of discount of tax? At what speed does light travel? What is the speed of your car? What area is to be painted? What is the percentage of marks of your last exam? etc., etc. The answer to each such question is always a number. In case we didn't have the knowledge of number could we have answered such questions? We all know while preparing tea or *torkary* , how all mothers knowingly or unknowingly use *ratio*, *proportion*, and *mean* while distributing things. Even fruit sellers use *mode* unknowingly. I can give many such examples to establish the fact that we can't even move an inch without mathematics. Whether you are a cook or a farmer, a mechanic or a carpenter, a shopkeeper or a doctor, a programmer or web developer, an accountant or a businessman, an engineer or a scientist, a musician or a magician…,

everybody needs mathematics in day to day life. Probably all living organisms on earth use it for its existence on its own way. Yet can we deny the mathematics phobia or anxiety of our students? What about those 80% mathematics disliking people? Why and how such things happen? Where does the problem lie? What about the solutions? Is mathematics really tough?

We need solution by all means. It is a matter of concern to all. Historically when Brahmagupta, hindu astronomer and mathematician defined and developed a symbol for zero (*shunya*) and Aryabhata gave the digit 0 (zero) the other part of the world laughed at it, saying, "What? Zero? Nothing?" Today we all know without zero we cannot write big numbers. India always has a marvelous history of mathematics and countless great mathematicians. From very early ages in India, mathematical ideas, concepts were practised systematically and practically. Arguably the Vedas are the oldest book of "world civilization. According to Rig Veda we get the concept of, "33 crore Hindu Gods and Goddesses". In the context of that era (between 7000 to 5000 BC) 33 crore was a huge number that our ancestors were exercised which speaks the volume or justifies the fact, how good were they in mathematics. The famous Pythagoras theorem (Greek philosopher Pythagoras 570 BC) before it came to the scenario of mathematics practised here in our country but in a slightly different way, the Sulba-Sutra, the idea given by Baudhayan (800 BC) a great Indian mathematician. The Sulba-Sutra states, "In a rectangle the area formed by a diagonal is equal to sum of the areas formed by its length and breadth." In 12th century Bhaskara the author of Siddhanta Siromani declared, "Any number divided by zero is infinity and that the sum of any number and infinity is also infinity."

One can keep on talking day in and day out about our rich history of mathematics. Vedic mathematics is still relevant and is very popular in many foreign countries, the ideas of Nikhilam, Navaseshcheck, Urdhwa Tiryag Byam etc., can still amaze us.

Having such a wonderful history of mathematics, isn't it painful to all of us when many of our students suffer from mathematics phobia, or anxiety?

One day I asked a top ranked student of class VI, "What is perimeter?" Two times length plus breadth, she answered. I told that it was a formula to find the perimeter of a rectangle only. Can you find the perimeter of a triangle? I asked again. She had no idea. I can assure you that she is a good student but had no clear concept on perimeter. Why? Does the feeder (teacher) not feed her properly? When I practically taught her, the very next day she showed me finding out the perimeters of many existing things at her home and that too in a very enthusiastic way. I gave her no formula to find perimeter but taught, what the perimeter is all about. I experienced many such incidents so far, however those are irrelevant to disclose here of course.

So then, aren't we responsible for the students' mathematics phobia to some extent? It is time to introspect, it is time to look back.

For last few years I have been associated with the In Service Teachers Training Program of our district Sivasagar, but I have a doubt on its successfulness or total impact on students. Doubt in the sense that the "follow up action" by the participant teachers in their respective schools. So may I urge the higher authority to take the matter as seriously as it can be from the grass root level. We must have a kind of responsibility and a kind of accountability to our profession. One should remember that, mathematics is not simply about numbers, addition, subtraction, calculation, formula, geometry, algebra but mathematics is like finding patterns.

Japanese scholar Masao Marita says, “Mathematics is a totally endless open-ended creative act, It is a bit like music.” The word mathematics came from the Greek expression TAMATHEMATA. Its original meaning is, “Taking of that which you already have and knowing of that what you already know.” Being a teacher we should remember that we can’t teach students. Students learn on their own. We have to create a healthy environment where students can learn freely at ease. So how much we know is not the matter, we should find out what students know and should start from their end. Let’s play with the mathematical ideas with students and make learning as fun. Einstein said, “Play, is the highest form of research.”

It is said that any one can gain mathematical ideas, mathematical brain if one is given proper guidance and training in the formative period of one’s life. For this we need a good curriculum of mathematics and a healthy school environment as well as home environment.

Let’s be smart, be dedicative or else the saying will go on and on, “Mathematics used by all, detasted by many.”

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Mathematics for Recreation!

Consider the long division sum given below. The object is to find the digits represented by letters in it.

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a b ) c d e e b ( b f b
      c e b
      -----------
        g g e
        g c h
        -----
          c e b
          c e b
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[For solution see page 49]

Source : Arithmetical Restoration by W.W. Rouse Ball in Vol. four of ***The World of Mathematics :*** *Simon and Schuster, New York.*